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<th><strong>Docket Number:</strong></th>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Integrated Resource Plans (Publicly Owned Utilities)</td>
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<td>Presentation - City of Palo Alto Renewables Initiatives By: James Stack, PhD</td>
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<tr>
<td><strong>Description:</strong></td>
<td>Presentation to CEC, December 13, 2016</td>
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<td><strong>Filer:</strong></td>
<td>Le-Huy Nguyen</td>
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City of Palo Alto
Renewables Initiatives

Presentation to CEC
December 13, 2016

Jim Stack, PhD
Outline

- How Palo Alto has achieved a 50% RPS
- Obstacles that need to be addressed
- The role of energy storage
- The role of distributed resources
- Palo Alto’s unique challenges and goals
- Questions
Palo Alto’s Utilities Services

- Water - 1896
- Fiber - 1996
- Electric - 1900
- Wastewater - 1898
- Storm Drain
- Gas - 1917
How Palo Alto has achieved 50%
How Palo Alto has achieved 50%

- Adopted a voluntary RPS target in 2002
- Began executing PPAs in 2004
- Now have 13 executed PPAs (plus 3 terminated)
  - 6 solar (5 operating)
  - 5 landfill gas (all operating)
  - 2 wind (both operating)
- Aggressive energy efficiency efforts to reduce load
- This effort has required a major investment of staff time, training, and resources
Palo Alto’s Renewable Resources

5 Solar Projects 🌞
- Elevation Solar C
- Western Antelope Blue Sky Ranch B
- Frontier Solar
- EE Kettleman Land
- Hayworth Solar

2 Wind Projects ⚡
- High Winds
- Shiloh Wind

5 Landfill Gas Projects 🌲
- Santa Cruz
- Ox Mountain
- Keller Canyon
- Johnson Canyon
- San Joaquin

Small Hydro Projects 🌊
- New Spicer Meadows
- Lewiston, Nimbus, Stampede
Obstacles that Need to be Addressed

Macro Level Challenges

- Skyrocketing TAC rates
- Falling LMPs → More curtailment, less value
- Rising (and constantly evolving) RA requirements and costs
- Uncertainty around impacts of regionalization on RPS/RA/GHG regulations
- Inability for local DERs to be counted toward RA requirements
Obstacles that Need to be Addressed

Regulatory Wish List

- Need for regulatory consistency and predictability
- Regulations should reward early action, not discourage it
- Minimize reporting redundancy
- IRPs should be flexible
  - One size does not fit all
  - Things change over time
The Role of Energy Storage

- No role at present—not cost-effective
- May become cost-effective post-2020
  - Palo Alto evaluating small-scale pilot project for customer-sited storage
- When cost-effective, it will be useful for:
  - Minimizing curtailment of solar resources
  - Mitigating the duck curve
  - Satisfying RA and AS needs
  - Improving grid stability/resiliency
The Role of Distributed Resources

- Local PV currently meets ~1% of Palo Alto energy needs
  - Goal of meeting 4% of energy needs by 2023
  - Ranked 7th in US for PV installations per capita
  - Feed-in tariff program active
  - Planning community solar program
- Very high penetration of EVs (1600 registered in Palo Alto, plus commuter vehicles)
- Minimal distribution system impact to date
- Voluntary demand response program
  - Can reduce summer peak load by 300-900 kW
Palo Alto’s Unique Challenges

- Very limited potential for local generation
- High PV and EV penetration
  - Difficulty forecasting long-term load
  - Difficulty with distribution system planning
- Heavy concentration of hydro resources
Palo Alto’s Unique Goals

- Carbon Neutral supply portfolio (since 2013)
- Local Solar Plan
  - Meet 4% of energy needs by 2023
  - Feed-in tariff program & community solar
- Big electrification push (natural gas & transportation)
- Sustainability/Climate Action Plan
  - 80% GHG reduction by 2030
Questions/Feedback

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